Print Form

Jaycar Electronics
Better. More Technical

RICH ELECTRIC

SuperCombi & CombiPlus

Quick Install & Programming Check List for Stand-Alone & Grid Powered Systems

This check list provides basic programming and commissioning information for your Stand-Alone or Grid Powered System (UPS).
Please make sure you have read and understood the User Manual before attempting to power up you Combi inverter. If you are unsure please contact powertech@jaycar.com.au
This checklist should be used in conjunction with the CEC (Clean Energy Council) BCSE Accreditation "Stand-Alone Power Systems Inspection "form" that can be downloaded from there website:
http://www.solaraccreditation.com.au/acccec/installerresources/formsandchecklists.html

Stand-Alone Power System design must comply with the mandatory requirements, and follow the recommendations of AS4509.2 SPS Design Guidelines and AS3000 Wiring Rules.

Invertek®
Pure Sine Wave
Interactive Inverter Charger

DC Battery Cable – "Battery to Combi" Checked ☐

1500W 12V Recommended cable size 0AWG up to 2m
1500W 24V Recommended cable size 2AWG up to 2m
3000W 12V Recommended cable size 000AWG up to 2m
3000W 24V Recommended cable size 0AWG up to 2m

Item \ Model	SC-1500-12X	SC-1500-24X	SC-3000-12X	SC-3000-24X
Minimum Battery Capacity (Ah)	200Ah	100Ah	400Ah	200Ah
Recommended Cable Size	53.5 mm^2 0 AWG	33.6 mm^2 2 AWG	85 mm^2 000 AWG	53.5 mm^2 0 AWG

NOTE: Consult your battery manufacturer for correct battery sizing for your application, Battery cable sizes are based on recommended cable length of 2 meters. Longer cable lengths will require large cable sizes.

DC Battery Fuse Protection – Battery to Combi Checked ☐

MAX DC Fuse Size:
1500W 12V 250Amp
1500W 24V 125Amp
3000W 12V 500Amp
3000W 24V 250Amp

Note:

- *Protection is required on both Positive and Negative cables when the battery is NOT earthed.*
- *Never connect TWO battery banks via a switch.*

Warning Check Polarity…. Before Connection!!

Battery Capacity – Minium Requirements Checked ☐

1500W 12V 200Ah @12V (C10)
1500W 24V 100Ah @24V (C10)
3000W 12V 400Ah @12V (C10)
3000W 24V 200Ah @24V (C10)

Note: *C10 Rate refers to the Amperage discharge over a 10 Hour period.*

AC Wiring Connections to Combi Checked ☐

The AC Input Current limit from the AC Generator or Mains Grid supply must be set in the Combi's AC Input Current setting B2-05.
The length of the AC input cable is also required to calculate the correct size that should be used when allowing for maximum input and outputs:

SuperCombi©	Inverter AC Input		
	MCB/RCD	MIN AC Cable Size single Twin-core and earth	
Model	MAX Circuit Breaker Current	Enclosed conduit	Unenclosed free air
1500watt	16Amp	2.5mm	1.5mm
3000watt	32Amp	6mm	4mm
6000watt	63Amp	16mm	10mm

SuperCombi©	Inverter AC Output		
	MCB/RCD	MIN AC Cable Size single Twin-core and earth	
Model	MAX Circuit Breaker Current	Enclosed conduit	Unenclosed free air
1500watt	25Amp	4mm	2.5mm
3000watt	50Amp	16mm	10mm
6000watt	100Amp	35mm	25mm

Note: *Never connect the AC supply without the battery connected.*
If you are not using the boosting feature from the AC input, you can prevent the Combi from going into over load by using a smaller AC Breaker on the output side of the inverter.

Example: *1500W use 6 Amp, for the 3000W use 10 Amp standard "C-Type" breaker.*

Breaker Size recommendations if not using the Boosting feature or AC Generator

Model	MCB / RCD	Curve Type
1500watt	6 Amps	C-Type (Standard)
3000watt	10 Amps	C-Type (Standard)
6000watt	20 Amps	C-Type (Standard)

B2-01~08: AC Input Voltage & Frequency Input Check Table Checked ☐

The following Check Table is a summary of the following sections.

Setting	Function
B2-08=0	When B1-01=0: Acceptable AC input frequency is 50Hz ±5Hz (45~55Hz)
	When B1-01=1: Acceptable AC input frequency is 60Hz ±5Hz (55~65Hz)
B2-08=1	Accept wide AC input frequency range between 45~65Hz
B2-01=190	AC Low Input Cut Out Voltage (190VAC)
B2-02=197	AC Low Input Cut In Voltage (197VAC)
B2-03=255	AC High Input Cut In Voltage (255VAC)
B2-04=260	AC High Input Cut Out Voltage (260VAC)
B2-05= AMPS	AC Input Current = 3.33x VA of AC Generator (AMPS)
B2-06=0 (Ignore)	If you are connected to the Mains Grid then for faster change over times you can disable the waveform check.
B2-06=1 (Active)	If you are using an AC Generator
B2-07=1	The internal ground relay is closed *"Internally the Neutral & GND are joined when in inverter mode only.(AC Out)"*
B2-07=0	The internal ground relay is open *"Internally the Neutral & GND are NOT joined when in inverter mode only.(AC Out)"*
B2-09=1	Dynamic Power: Dynamic. Select Dynamic when operating smaller AC Generators less than 3kVA. AC load is supported by the Inverter, then slowly pushed across to the AC Generator.
B2-09=0	Dynamic Power: Normal. Select Normal when operating larger AC Generators or when connected to Mains Grid. The AC load is supported directly by the AC Generator or Mains Grid.

B2-08: AC Input Frequency Checked ☐

- Check the AC Input and Frequency ranges are set correctly.
  The default setting is for wide range of voltage and frequency.
- If your system is using a cheaper style generator we recommend you adjust the Combi for a more selective range,

Example: B2-08= 0 (45~55Hz) Narrow range,
B2-08=1 (45~65Hz) Wide range.

B2-01~04: AC Input Voltage Checked ☐

- If your system is using a cheaper style AC Generator we recommend you adjust the Combi for a narrower voltage range to offer better protection to your appliances and the Combi. These Voltage input parameters can be adjusted:

Example: LOW: B2-01=190VAC and B2-02=197VAC,
HIGH: B2-03=255VAC and B2-04=260VAC

B2-05: AC Input Current Checked ☐

- **It is very important** to correctly program your Combi to suit the size of your AC Generator or Mains Supply!!

  If you don't, Power Share, Power Support, Dynamic Power Shifting will NOT work! Furthermore, you can overload your inverter!
- YOU MUST NEVER set the Combi's AC Input Current "B2-05"(18~21) higher than the Continuous Output rating of your AC Generator or Mains Supply.
- Generally, a good rule of thumb is take the AC Generators kVA rated output and multiply it by 3.33, Example: If you have a 3.6kVA AC Generator, then the maximum AC Input Current is 3.6 x 3.33. = 12 Amps (11.99).
- We recommend you use this rule to set the AC Input Current to the Combi. This is programmed into B2-05 settings; also check B2-18~21 these should be the same value as set in B2-05. We recommend the use of inverter style AC Generators.
- USE ONLY Mode 1 or Mode 2 for AC Generators. (See Dynamic Power Shifting for Mode 2 options)

- For more on Mains AC connected systems please refer to the User Manual.

B2-06: AC Input Current Checked ☐

- B2-06=1 (Active) If using a Generator, always use waveform check "Active"
- B2-06=0 (Ignore) If you are connected to the Mains Grid, then for faster change over times you can disable the waveform check.

B2-07: AC Ground Relay (MEN) Checked ☐

- B2-07=0 (Open). If the installation has MEN on the AC output side of the inverter or the Negative wires are connected to the MEN from the AC Input and Output from the Combi, then the Ground Relay must be inactive
- B2-07=1 (Closed).If the Combi is used with an AC Generator or there is NO MEN point on the AC Output, then the Ground Relay must be activated. See AS3000 for more info.

Battery Charger Settings Checked ☐

- Check that the correct charger voltages have been adjusted to suit your battery.
- Failure to do so can destroy your batteries and could damage the Combi.

Example: PowerStacks SB-1800 & SB-1802 & PowerSleak SB-1822 "AGM" –

24V System

D1-03=26.76 Absorb / Bulk 27.6V
D1-07=23.76 Float 26.76V
D1-10= 0 Equalization charge OFF,

12V System

D1-03=13.80 Absorb / Bulk 13.8V
D1-07=13.50 Float 13.5V
D1-10= 0 Equalization charge OFF,

D1-08 Please DO NOT ADJUST the battery charger current D1-08
Unless you have consulted with us first.

General Installation Checklist	Checked ☐

- LV wiring must be installed by a qualified electrical tradesperson
- Safe isolation must be provided between ELV and LV Circuits
- Over-current protection and isolation are rated for AC or DC at the appropriate voltage and currents.
- Shutdown procedure is prominently displayed
- Access to equipment such as batteries is restricted to authorised personnel
- Adequate ventilation is provided to all electrical equipment
- All cables satisfy both voltage drop and current carrying capacity
- All exposed cabling is provided with mechanical protection
- Lighting protection has been provided (if required).
- Equipment is labelled, convenient, accessible and visible
- There are no live parts accessible on any installed equipment.
- Main Battery over-current protection installed in all un-earthed conductors
- A means to readily isolate the battery bank is installed
- The batteries are installed in a appropriate ventilated dedicated room, enclosure or restricted access area designed to prevent unauthorised entry
- “Warning- Spark Hazard” sign is mounted above or next to the batteries
- Battery warning signs “DANGER – Risk of Battery Explosion and Electrolyte Burns” are clearly visible.
- There are NO arc producing devices in the area.
- ELV cables are to be labelled to identify solar, and DC circuits, and cabling.

EXAMPLE: Remote Power System - 1050Watt Combi Schematic

AC Generator

AC Input

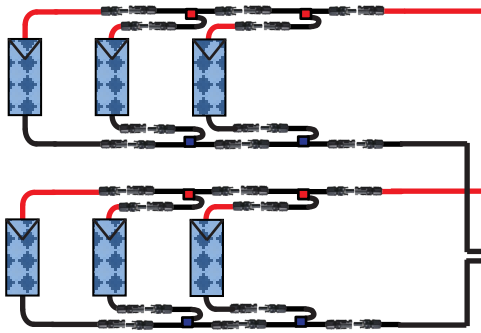
SuperCombi 1500W
MI-5251

MODE 2:
Set B2-05 & 18
AC Input Current
= 3.33x kVA rating
See check list for
more information.

From SuperCombi PORT- C (EXT)

Note: This is a RJ50 (MOD10) connection
with 10 core cable. WI-5252

Roof Area



FUSE
FUSE

CombiNet - IN

MCB

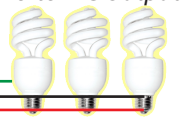
MCB Amp Rating:
3x kVA generator rating = Amp
2kVA Example: 3x2= 6Amp

Main AC Output Switch
MCB Amp Rating:
6Amps + 3x kVA
Generator rating

2kVA Example:
6+ 3x 2 = 12Amp
Round down
10 Amp

RCD/MCB:
Power and Lighting
Circuits

AC load
Inverter AC Output



SuperCombi Settings

Important: Make Sure B2-05 AC Input has been programmed correctly
Mode 2 operation for AC Generator
B2-05 & 19=3.33x kVA Generator rating.
Note: *Mode 2 AC Generators Over 3kVA set B2-09 = 0 "Normal"*

Battery Charger Settings:
D1-03 "Absorb Volatge = 27.6VDC"
D1-07 "Float Voltage = 27.0VDC"
D1-08 "Charger Current = 35Amp"
D1-10 = 0 "Equalization Charge Off"

AC load
Inverter AC Output

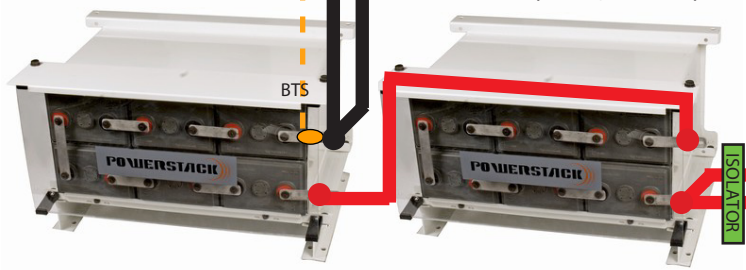
BTS - Battery Temperature Sensor wire

Earth Bar

125Amp
FUSE
FUSE

FUSE
FUSE
45Amp

24VDC Battery System
2x SB-1800 (12V @ 600Ah)



Max Cable distance from SunStar Solar Controller to Battery Bank - 8m @ 8AWG , 21m @ 4AWG
Max Cable distance from SuperCombi to Battery Bank - 1m @ 4AWG , 1.5m @ 2AWG, 2.5m @ 0AWG
Recommended minimum AC Cable size 2.5mm² See user manual for more details.
Note: Max Cable distance is calculated at less than 5% voltage drop. All AC wiring to be installed by licensed electrician and must comply with AS3000 Wiring Rules & AS NZS 4509 standards.

KEY

FUSE 30Amp DC

FUSE 125Amp DC Battery Fuse

FUSE 45Amp DC

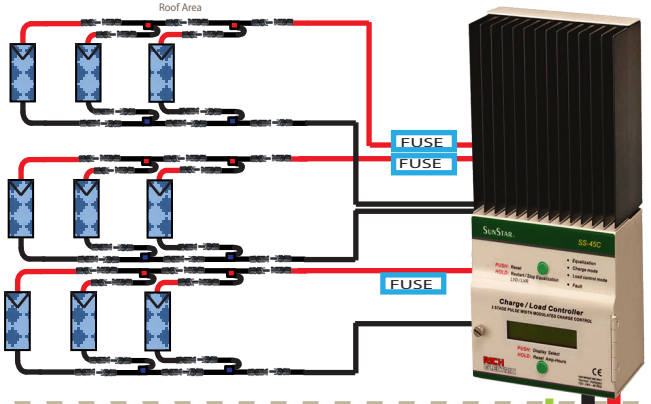
EXAMPLE: Remote Power System - 1575Watt Combi Schematic

AC Generator

SuperCombi 3000W
MI-5253

MODE 2:
Set B2-05 & 18
AC Input Current
= 3.33x kVA rating
See check list for
more information.

Roof Area



Note: This is a RJ50 (MOD10) connection
with 10 core cable. WI-5252

From SuperCombi PORT- C (EXT)

Main AC Output Switch
MCB Amp Rating:
10Amps + 3x kVA
Generator rating

6kVA Example:
10+ 3x 6 = 28Amp
Round down
25 Amp

RCD/MCB:
Power and Lighting
Circuits

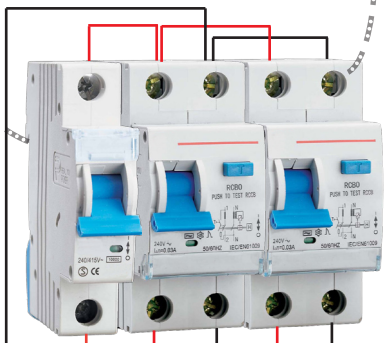
AC load
Inverter AC Output

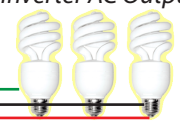
MCB

SuperCombi Settings

Important: Make Sure B2-05 AC Input has been programmed correctly
Mode 2 operation for AC Generator
B2-05 & 19=3.33x kVA Generator rating.
Note: *Mode 2 AC Generators Over 3kVA set B2-09 = 0 "Normal"*

Battery Charger Settings:
D1-03 "Absorb Volatge = 27.6VDC"
D1-07 "Float Voltage = 27.0VDC"
D1-08 "Charger Current = 35Amp"
D1-10 = 0 "Equalization Charge Off"





AC Input

AC load
Inverter AC Output

BTS - Battery Temperature Sensor wire

Earth Bar

60Amp
FUSE
FUSE

MCB Amp Rating:
3x KVA generator rating
6kVA Example: 3x6= 18Amp

FUSE
FUSE
250Amp

ISOLATOR

2x SB-1802
(12V @ 1350Ah)

BTS

24VDC @ 1350Ah
Battery System

Max Cable distance from SunStar Solar Controller to Battery Bank - 5m @ 8AWG , 14m @ 4AWG
Max Cable distance from SuperCombi to Battery Bank - 1m @ 4AWG , 1.5m @ 2AWG, 2.5m @ 0AWG
Recommended minimum AC Cable size 2.5mm² See user manual for more details.
Note: Max Cable distance is calculated at less than 5% voltage drop. All AC wiring to be installed by licensed electrician and must comply with AS3000 Wiring Rules & AS NZS 4509 standards.

KEY

FUSE 30Amp DC

FUSE 250Amp DC Battery Fuse

FUSE 60Amp DC

EXAMPLE: Remote Power System -3150Watt Combi Schematic

AC Generator

AC Input

SuperCombi Settings

Important: Make Sure B2-05 AC Input has been programmed correctly
Mode 2 operation for AC Generator
B2-05 & 19=3.33x kVA Generator rating.
Note: *Mode 2 AC Generators Over 3kVA set B2-09 = 0 "Normal"*

Battery Charger Settings:
D1-03 "Absorb Volatge = 27.6VDC"
D1-07 "Float Voltage = 27.0VDC"
D1-08 "Charger Current = 35Amp"
D1-10 = 0 "Equalization Charge Off"

MODE 2:
Set B2-05 & 18
AC Input Current
= 3.33x KVA rating
See check list for
more information.

Roof Area

FUSE

FUSE

FUSE

Roof Area

FUSE

FUSE

FUSE

Note: This is a RJ50 (MOD10) connection with 10 core cable. WI-5252

From SuperCombi PORT- C (EXT)

SuperCombi 3000W
MI-5253

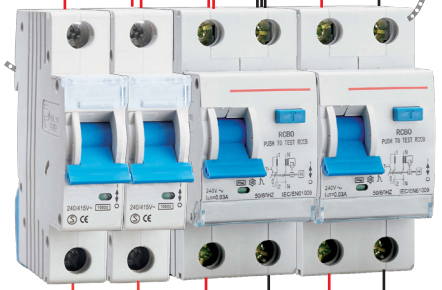
Parallel Hub MI-5277

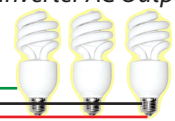
Main AC Output Switch
MCB Amp Rating:
10Amps + (3x kVA /2)
Generator rating

12kVA Example:
10+ (3x 12 / 2) = 28Amp
Round down
25Amp each

RCD/MCB:
Power and Lighting Circuits

AC load
Inverter AC Output





MCB

MCB Amp Rating:
3x kVA generator rating = Amp
12kVA Example: 3x12= 36Amp
divided by 2x breakers then
round down = 16 Amp

AC load
Inverter AC Output

BTS - Battery Temperature Sensor wire

Earth Bar

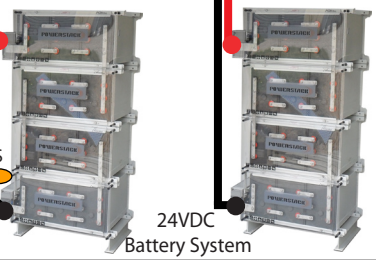
FUSE FUSE FUSE FUSE 60Amp

FUSE
FUSE
FUSE
FUSE
250Amp

4x SB-1802 (12V @ 1350Ah)

FUSE

ISOLATER



BTS

24VDC
Battery System

Max Cable distance from SunStar Solar Controller to Battery Bank - 5m @ 8AWG , 14m @ 4AWG
Max Cable distance from SuperCombi to Battery Bank - 1m @ 4AWG , 1.5m @ 2AWG, 2.5m @ 0AWG
Recommended minimum AC Cable size 2.5mm² See user manual for more details.
Note: Max Cable distance is calculated at less than 5% voltage drop. All AC wiring to be installed by licensed electrician and must comply with AS3000 Wiring Rules & AS NZS 4509 standards.

KEY

FUSE 30Amp DC

FUSE 250Amp DC Battery Fuse

FUSE 60Amp DC